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(54) **Security seal.**

(57) A security seal for enclosing an article comprises a strap (1,21) having at a first end an enclosure (2,22) defining a passage (3,23) through which the other end of the strap is irremovably insertable to an adjustable extent. A side wall (6,21A) of the enclosure is provided with a pull-off tab (7,29) enabling said side wall to be torn off, thereby releasing the strap from the passage or separating the first end of the strap from the enclosure.

EP 0 398 562 A1

SECURITY SEAL

This invention relates to a security seal which is primarily intended to encompass the neck of a bag or like package for the purpose of preventing or signifying unauthorised interference with the contents of the package.

EP-A-0 073 633 discloses a security seal of this kind. This known seal comprises a strap having at one end an enclosure defining a passage through which the other end of the strap is irremovably insertable. The strap extends around and beyond the enclosure to form a pull-off tab and a tear line is formed on the strap extending around the enclosure such that tearing along this line separates the end of the strap having the tab from the enclosure.

The above design of seal requires a relatively large amount of material to form the extension of the strap around the enclosure. We have therefore sought an improved design which requires less material and hence permits a smaller seal to be made.

According to the present invention, there is provided a security seal for enclosing an article, comprising a strap having at a first end an enclosure defining a passage through which the other end of the strap is insertable to an adjustable extent, the strap thereafter being irremovable except on tamper-evident breakage of at least part of the seal, characterised in that a side wall of the enclosure is provided with a pull-off tab enabling said side wall to be at least partly torn off, said side wall defining a part of said passage or being a part in common of both the enclosure and the strap adjacent the enclosure, whereby tearing of the side wall releases the strap from the passage or separates the first end of the strap from the enclosure.

In one embodiment of the invention, the side wall defines a part of the passage, and the pull-off tab is preferably in the form of a loop, through which a thread-like article can be inserted to assist in pulling off the side wall and thereby releasing the strap from the passage. The strap is preferably of sufficient length that, after passing through the enclosure, the free end can be inserted through the loop, whereafter pulling the free end will remove the side wall.

In another embodiment, the side wall is constituted by a part of the strap adjacent the first end, the side wall being joined to the rest of the enclosure along at least one line of weakness. The pull-off tab may then be constituted by the part of the strap extending from the side wall to the first end. The part of the strap constituting the side wall is preferably joined to the enclosure by a line of weakness along each of its two edges.

The passage is preferably of irregular cross-section and at least part of the strap is of similar irregular cross-section so that the strap can only be inserted in the passage in a defined orientation. One face of the strap adjacent the said other end may be provided with an upstanding enlargement, and the passage then has a corresponding cross-section.

The strap may be provided on one side with at least one row of spaced teeth which interact with a resiliently deformable member in the passage to permit insertion of the strap into the passage but prevent withdrawal.

Reference is now made to the accompanying drawings, in which:

Figure 1 is a cut-away perspective view of part of a seal according to a first embodiment of the invention;

Figure 2 is a partial cut-away view complementary to Figure 1;

Figures 3, 4, 5 and 6 are diagrammatic views showing the progressive steps in release of the seal of Figures 1 and 2;

Figure 7 is a perspective view showing a modification of the seal of Figures 1 to 6;

Figure 8 is a cut-away view corresponding to Figure 7;

Figure 9 is a partial perspective view of a seal according to a second embodiment of the invention;

Figure 10 is a partial cut-away view corresponding to Figure 9; and

Figures 11, 12, 13 and 14 are diagrammatic views showing the progressive steps in release of the seal of Figures 9 and 10.

In the first embodiment shown in Figures 1 to 6, the seal is of integral construction and made of plastics material such as nylon or PVC. Figure 1 is a view cut-away along a longitudinal line of symmetry and Figure 2 is a complementary cut-away view. The seal comprises a strap 1 having at one end an enclosure 2. The enclosure defines a passage 3 through which the other end of the strap can be inserted to an adjustable extent. A row of ratchet-like teeth 4 is provided on one side of the strap and are able to interact with a resiliently deformable barb 5 in the passage 3. As the free end of the strap is inserted through the passage 3, the barb 5 is deflected sideways by the sloping sides of the teeth 4, and thereafter allows the strap to travel in the direction of insertion. However, if an attempt is made to pull the strap out of the passage in the opposite direction, the barb 5 engages with an adjacent tooth 4 to prevent such withdrawal.

A side wall 6 of the enclosure 2, opposite to the wall which carries the barb 5, is provided on its outside with a pull-off tab in the form of a substantially rectangular loop 7. The side wall 6 is defined by relatively thin areas 8, 9. Pulling on the loop 7 therefore causes rupture of the seal along the lines 8, 9 and the entire side wall 6 with the attached loop 7 is accordingly torn off.

The side wall 6 can be torn off as described above by inserting a thread-like article, or a hook or similar tool, through the loop 7 and pulling on the loop. However, as shown in Figures 3 to 6, it is particularly convenient if the strap 1 itself is used to assist in pulling off the side wall 6. The need for any additional tool is thereby avoided. As shown in Figure 3, when the seal has enclosed an article 10, such as the neck of a bag, a substantial length of the strap 1 protrudes beyond the enclosure 2. The free end of the strap 1 is folded back and inserted through the loop 7 (Figures 4 and 5). The strap is pulled through the loop until the slack nearly disappears, and then a sharp pull on the end tears off the side wall 6 with the loop 7 attached (Figure 6). The seal is thereby released from the article. It is intended that such breakage of the seal would only be carried out by authorised personnel and unauthorised breakage of the seal would be immediately evident.

In contrast to the seal of EP-A-0 073 633, the seal of the present invention does not require the strap to extend around and beyond the enclosure, and hence it can be made in a smaller size and using less material. Furthermore, because of the leverage provided by the free end of the strap in breaking the seal, it can be made of a stronger material than the prior seal, e.g. nylon as opposed to polypropylene.

Although it is intended mainly for the security of bags and sacks, the seal can also be used in other applications, for example as a cable tie in which the quick release means provided by the design may be advantageous.

In applying security seals of this type, it is possible that the strap may be inserted in the wrong end of the passage through the enclosure, or it may be inserted in the right end of the passage but the wrong way round so that the teeth 4 do not engage with the barb 5. This may be by mistake, or as part of a planned attempt to defeat the security of the seal. If this is done it is probable that there will be enough friction between the strap and the passage walls for the seal to be retained in an apparently secure condition. It would be visible to an inspector that the application was not correct, but this might well be overlooked if many sealed items were involved.

To prevent this occurrence, the seal described may be modified as shown in Figures 7 and 8. The

strap is provided at one side of the face containing the teeth with an upstanding enlargement 11. This may be along its whole length or only part of its length, and is suitably adjacent the end which is first inserted into the passage. The passage 3 is provided on its side adjacent the barb 5 with an indentation 12 along its length which corresponds with the dimensions of the enlargement 11. As a result, the strap can only be inserted into the passage in the correct orientation.

A second embodiment of the invention is illustrated in Figures 9 to 14. The seal is again of integral construction and made of plastics material. The seal again comprises a strap 21 having at one end an enclosure 22. The enclosure defines a passage 23 through which the other end of the strap can be inserted to an adjustable extent. The strap is provided with teeth 24 and the passage is provided with a resiliently deformable barb 25 which function in the same manner as described in the first embodiment. In this embodiment, there is a double row of teeth 24 on the strap, which helps to inhibit the entry of tampering probes. One face of the enclosure 22 is provided with upstanding spikes 26 which engage the neck of the bag or the like to be sealed.

In this embodiment, the passage 23 is not itself provided with a tear-off section and can therefore be made stronger than in the first embodiment. The enclosure is provided with two tapering wing portions 27, 28 which are joined at their ends to edge portions of the strap 21 adjacent its first end 29. A pull-off tab is formed by the end portion of the strap 21 extending from the enclosure to the end 29 of the strap, and this end is provided with a knob 30 to assist manual gripping thereof. The portion of the strap joined to the wing portions 27, 28 thus constitutes a side wall of the enclosure.

Figures 11 to 14 show the functioning of the second embodiment. In Figure 11, a spike 26 is engaged with the neck of the package 31 to be sealed. The strap is then wrapped around the package and inserted through the passage 23 as shown in Figure 12. When the package is to be released by authorised personnel, the pull-off tab formed by the end 29 of the strap is pulled as shown in Figure 13, and the side wall of the enclosure constituted by the strap is pulled off along the lines of weakness which join it to the wing portions 27, 28. The strap is thus separated from the enclosure as shown in Figure 14.

This second embodiment of the invention also incorporates a feature corresponding to that shown in Figures 7 and 8. The passage 23 has a side indentation 32 which corresponds to an upstanding enlargement (not shown) on the face of the strap opposite to the teeth and near the end which is first inserted into the passage 23.

The second embodiment has the same advantages over EP-A-0 073 633 as the first embodiment, and can also be used in the same way. However, it is capable of use under more severe conditions as the passage in the enclosure is stronger.

Claims

1. A security seal for enclosing an article, comprising a strap (1,21) having at a first end an enclosure (2,22) defining a passage (3,23) through which the other end of the strap is insertable to an adjustable extent, the strap (1,21) thereafter being irremovable except on tamper-evident breakage of at least part of the seal, characterised in that a side wall (6,21A) of the enclosure is provided with a pull-off tab (7,29) enabling said side wall to be at least partly torn off, said side wall defining a part (6) of said passage or being a part (21A) in common of both the enclosure and the strap adjacent the enclosure, whereby tearing of the side wall releases the strap from the passage or separates the first end of the strap from the enclosure.

2. A security seal according to claim 1, in which the side wall defines a part of the passage, and the pull-off tab (7) is in the form of a loop, through which a thread-like article can be inserted to assist in pulling off the side wall and thereby releasing the strap (1) from the passage (3).

3. A security seal according to claim 2, in which the strap (1) is of sufficient length that, after passing through the enclosure (2), the free end can be inserted through the loop (7), whereafter pulling the free end will remove the side wall (6).

4. A security seal according to claim 1, in which the side wall is constituted by a part (21A) of the strap (21) adjacent the first end (29), the side wall being joined to the rest of the enclosure along at least one line of weakness.

5. A security seal according to claim 4, in which the pull-off tab is constituted by the part of the strap extending from the side wall (21A) to the first end (29).

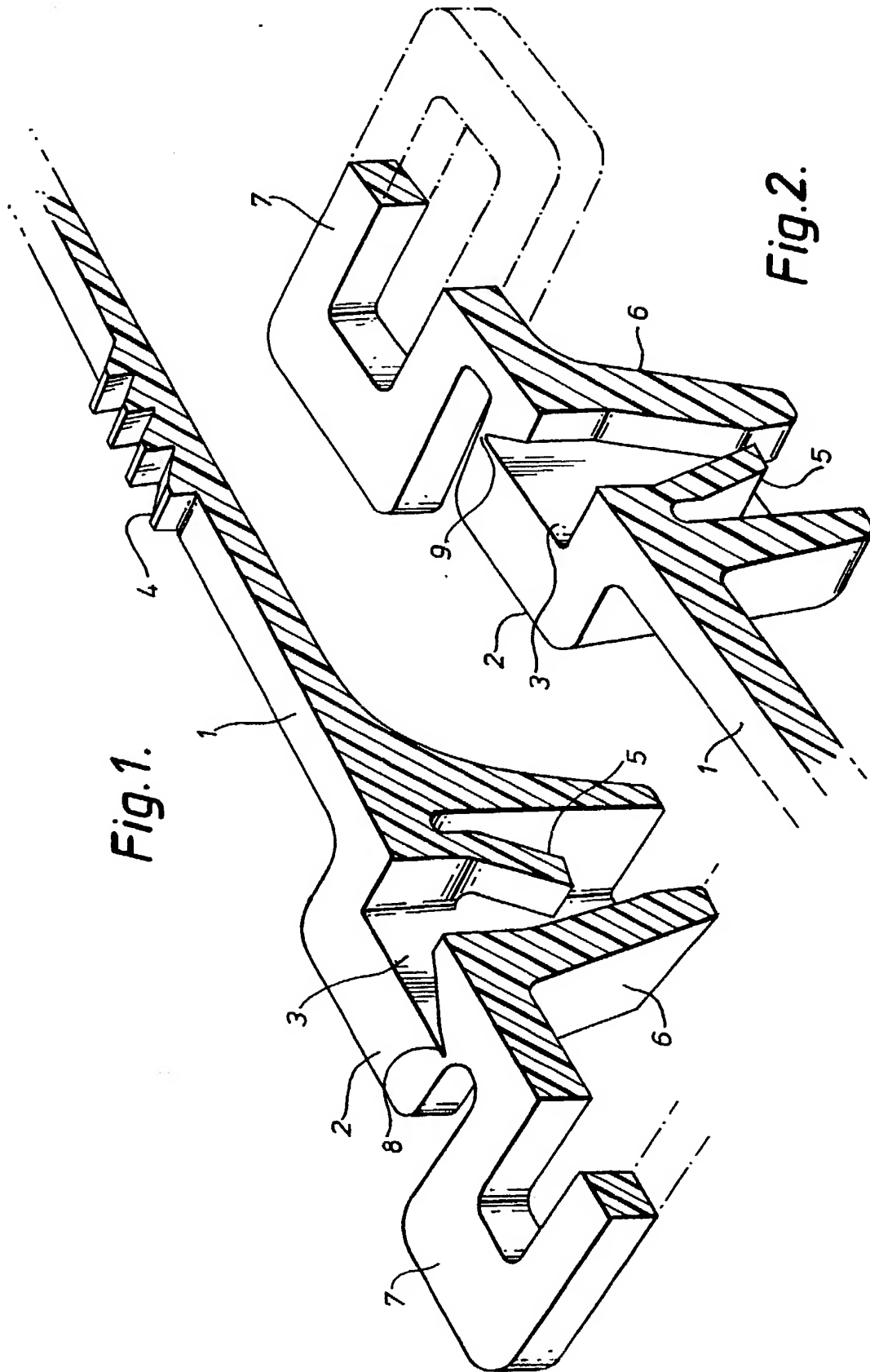
6. A security seal according to claim 4 or 5, in which the part of the strap (21A) constituting the side wall is joined to the enclosure by a line of weakness along each of its two edges.

7. A security seal according to any of claims 1 to 6, in which the passage is of irregular cross-section and at least part of the strap is of similar irregular cross-section so that the strap can only be inserted in the passage in a defined orientation.

8. A security seal according to claim 7, in which one face of the strap adjacent the said other end is provided with an upstanding enlargement (11), and the passage (3,23) has a corresponding

cross-section (12, 32).

9. A security seal according to any of claims 1 to 8, in which the strap (1,21) is provided on one side with at least one row of spaced teeth (4,24) which interact with a resiliently deformable member (5,25) in the passage (3,23) to permit insertion of the strap into the passage but prevent withdrawal.



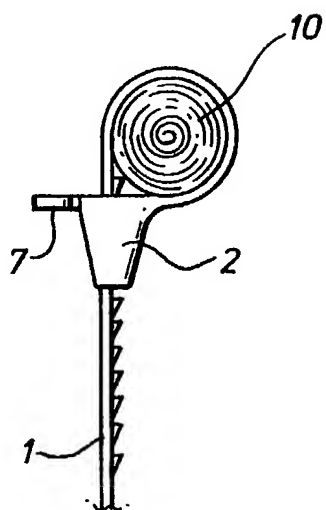


Fig. 3.

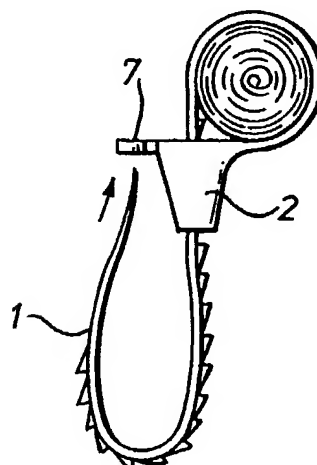


Fig. 4.

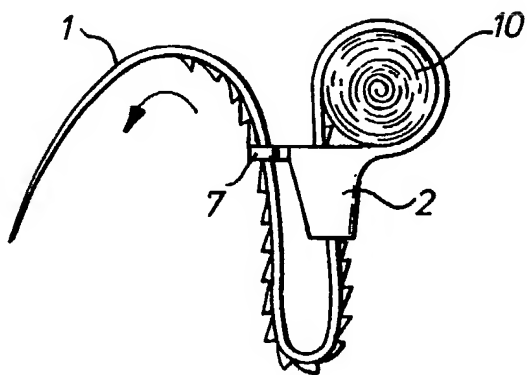


Fig. 5.

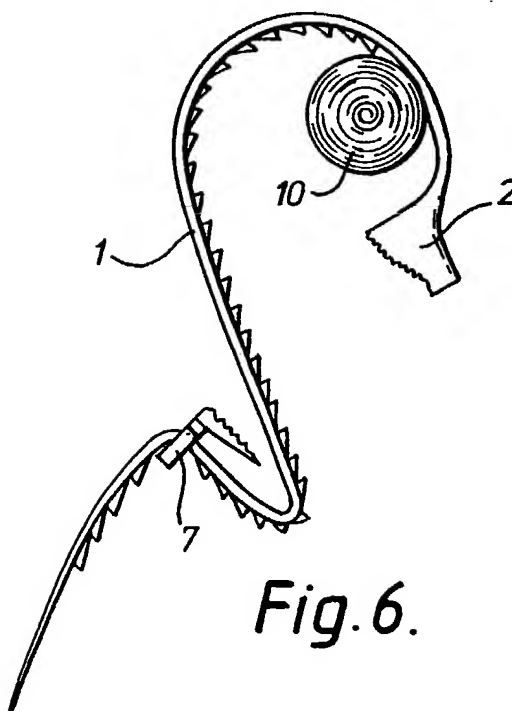
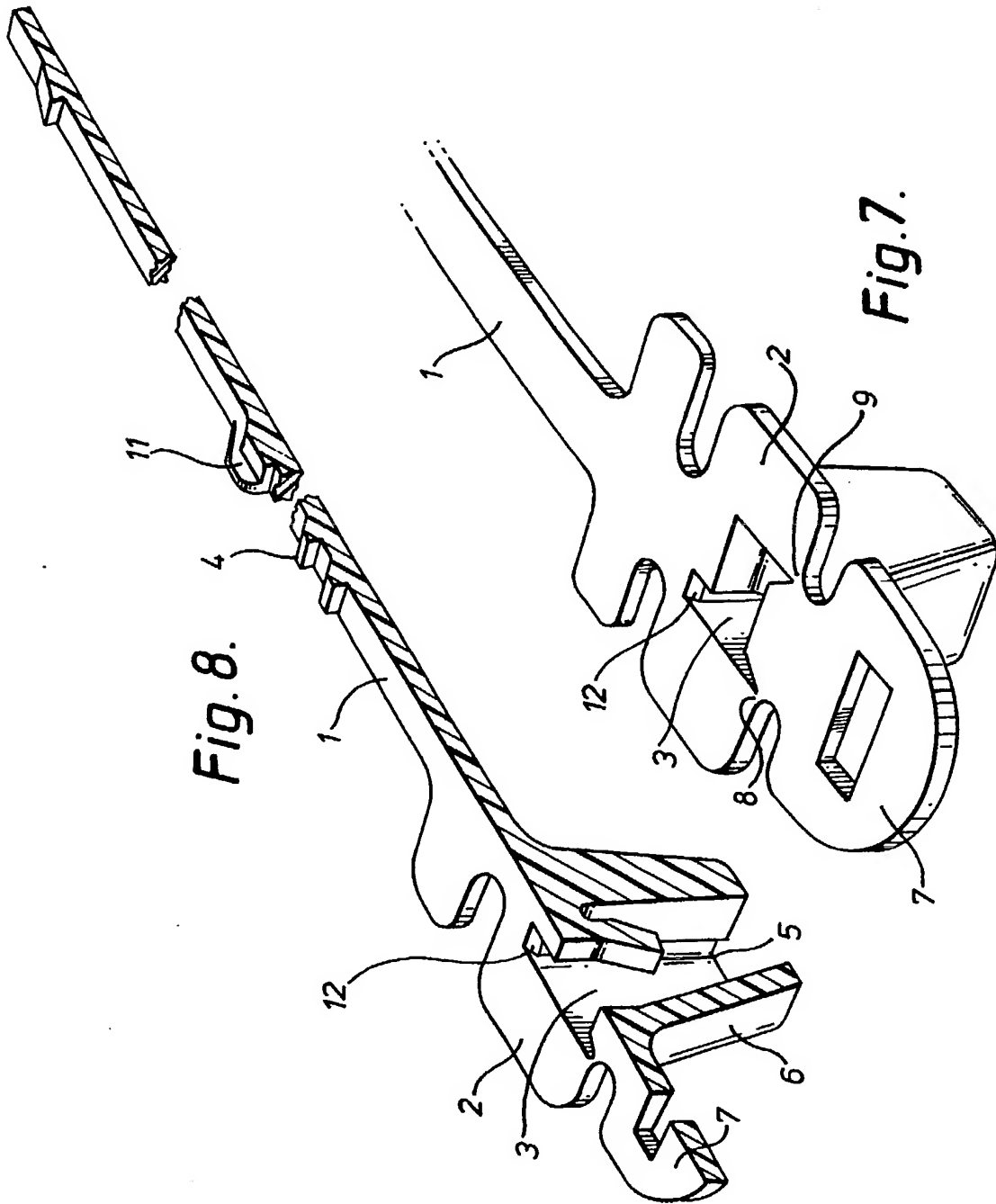
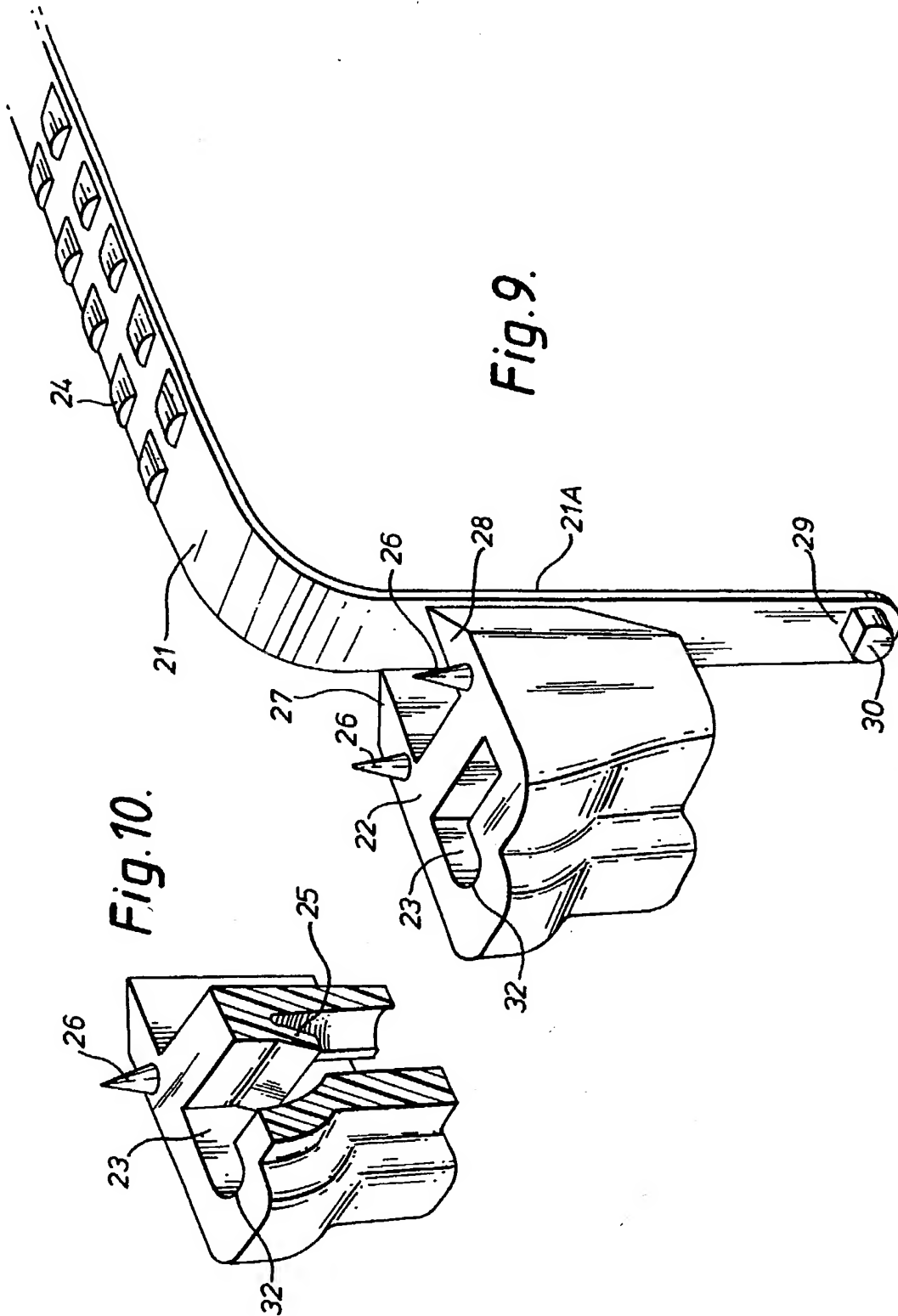


Fig. 6.





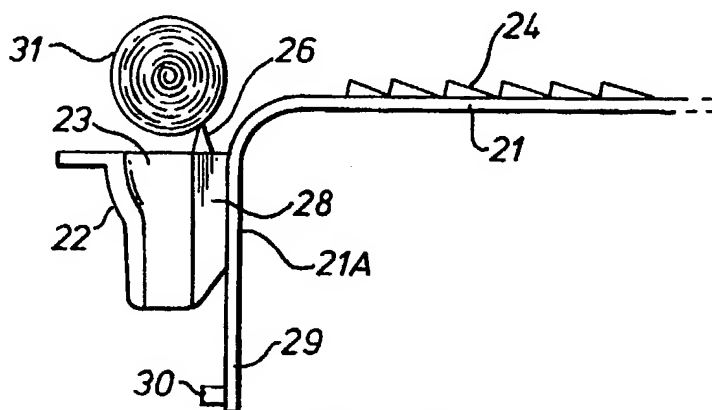


Fig.11.

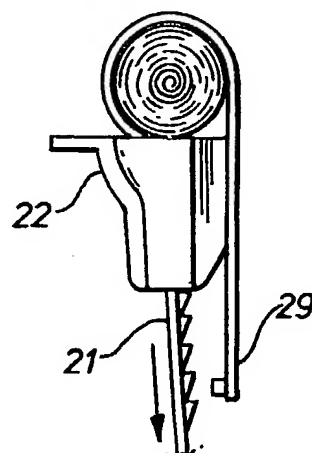


Fig.12.

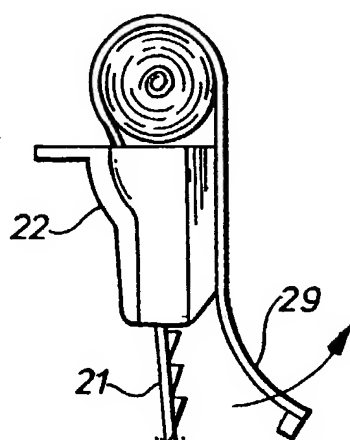


Fig.13.

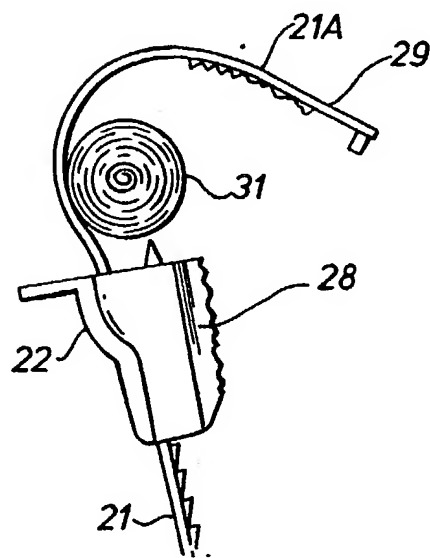


Fig.14.



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EUROPEAN SEARCH REPORT

Application Number

EP 90 30 4882

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	US-A-4 263 697 (SPEEDIE) * Column 2, lines 45-55,8-14; figures 1-3 *	1,7,9	B 65 D 63/10 B 65 D 77/18
X,D	EP-A-0 073 633 (ENVOPAK) * Page 8, claim 1; figures 1-4 *	1,5,7,9	
P,X	GB-A-2 212 764 (BOWTHORPE) * Page 7, claim 1; figures 1-4 *	1,7,9	
A		2,3,4,5,6	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 65 D G 09 F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 28-06-1990	Examiner BESSY M.J.F.M.G.
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